



Title: G Proteins, Polynucleotide Encoding the Same and Utilization
Thereof
Inventor: Y. Takahashi, *et al.*
Customer No.: 570 Sequence Listing
Atty. Docket No.: 600630-7US (562399)

SEQUENCE LISTING

<110> Sumitomo Chemical Company Limited

<120> NOVEL G PROTEINS, POLYNUCLEOTIDE ENCODING THE SAME AND UTILIZATION THEREOF

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<150> JP 2002/206841
<151> 2002-07-16

<150> JP 2002/367778
<151> 2002-12-19

<150> JP 2003/095955
<151> 2003-03-31

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<212> PRT
<213> Homo sapiens

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35 40 45
Ala Arg Thr Leu Leu Pro Arg Gly Gly Ser Pro Ala Cys Ala
50 55 60
Arg Pro Lys Ala Asp Lys Pro Lys Glu Lys Arg Gln Arg Thr Glu Gln
65 70 75 80
Leu Ser Ala Glu Glu Arg Glu Ala Ala Lys Glu Arg Glu Ala Val Lys
85 90 95
Glu Ala Arg Lys Val Ser Arg Gly Ile Asp Arg Met Leu Arg Asp Gln
100 105 110
Lys Arg Asp Leu Gln Gln Thr His Arg Leu Leu Leu Leu Gly Ala Gly
115 120 125
Glu Ser Gly Lys Ser Thr Ile Val Lys Gln Met Arg Ile Leu His Val
130 135 140
Asn Gly Phe Asn Pro Glu Glu Lys Lys Gln Lys Ile Leu Asp Ile Arg
145 150 155 160
Lys Asn Val Lys Asp Ala Ile Val Thr Ile Val Ser Ala Met Ser Thr
165 170 175
Ile Ile Pro Pro Val Pro Leu Ala Asn Pro Glu Asn Gln Phe Arg Ser
180 185 190
Asp Tyr Ile Lys Ser Ile Ala Pro Ile Thr Asp Phe Glu Tyr Ser Gln
195 200 205
Glu Phe Phe Asp His Val Lys Lys Leu Trp Asp Asp Glu Gly Val Lys
210 215 220
Ala Cys Phe Glu Arg Ser Asn Glu Tyr Gln Leu Ile Asp Cys Ala Gln
225 230 235 240
Tyr Phe Leu Glu Arg Ile Asp Ser Val Ser Leu Val Asp Tyr Thr Pro
245 250 255
Thr Asp Gln Asp Leu Leu Arg Cys Arg Val Leu Thr Ser Gly Ile Phe
260 265 270
Glu Thr Arg Phe Gln Val Asp Lys Val Asn Phe His Met Phe Asp Val
275 280 285
Gly Gly Gln Arg Asp Glu Arg Arg Lys Trp Ile Gln Cys Phe Asn Asp
290 295 300

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Val Thr Ala Ile Ile Tyr Val Ala Ala Cys Ser Ser Tyr Asn Met Val
 305 310 315 320
 Ile Arg Glu Asp Asn Asn Thr Asn Arg Leu Arg Glu Ser Leu Asp Leu
 325 330 335
 Phe Glu Ser Ile Trp Asn Asn Arg Trp Leu Arg Thr Ile Ser Ile Ile
 340 345 350
 Leu Phe Leu Asn Lys Gln Asp Met Leu Ala Glu Lys Val Leu Ala Gly
 355 360 365
 Lys Ser Lys Ile Glu Asp Tyr Phe Pro Glu Tyr Ala Asn Tyr Thr Val
 370 375 380
 Pro Glu Asp Ala Thr Pro Asp Ala Gly Glu Asp Pro Lys Val Thr Arg
 385 390 395 400
 Ala Lys Phe Phe Ile Arg Asp Leu Phe Leu Arg Ile Ser Thr Ala Thr
 405 410 415
 Gly Asp Gly Lys His Tyr Cys Tyr Pro His Phe Thr Cys Ala Val Asp
 420 425 430
 Thr Glu Asn Ile Arg Arg Val Phe Asn Asp Cys Arg Asp Ile Ile Gln
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<213> Homo sapiens

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<221> CDS

<222> (1)..(1377)

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gac	gac	ccc	tgc	gcf	gcc	tcg	gag	ccg	ccg	gtg	gag	gac	gcf	cag	ccc	96
Asp	Asp	Pro	Cys	Ala	Ala	Ser	Glu	Pro	Pro	Val	Glu	Asp	Ala	Gln	Pro	
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gcc	ccg	gcc	ccg	gcc	ctg	gcc	cca	gtc	cgf	gcf	gcc	gca	agg	gac	acg	144
Ala	Pro	Ala	Pro	Ala	Leu	Ala	Pro	Val	Arg	Ala	Ala	Ala	Arg	Asp	Thr	
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gcc	cgf	acc	ctg	ctc	cct	cgf	ggc	gac	ggf	gaa	ggg	agc	ccg	gca	tgc	gct	192
Ala	Arg	Thr	Leu	Leu	Pro	Arg	Gly	Gly	Gly	Glu	Gly	Ser	Pro	Ala	Cys	Ala	
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cgf	ccc	aaa	gca	gac	aag	ccg	aag	gag	aag	cgf	cag	cgc	acc	gag	cag	240
Arg	Pro	Lys	Ala	Asp	Lys	Pro	Lys	Glu	Lys	Arg	Gln	Arg	Thr	Glu	Gln	
65				70					75					80		

ctg	agt	gcc	gag	gag	cgc	gag	gcf	gcc	aag	gag	cgc	gag	gcf	gtc	aag	288
Leu	Ser	Ala	Glu	Glu	Arg	Glu	Ala	Ala	Lys	Glu	Arg	Glu	Ala	Val	Lys	
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gag	gcf	agg	aaa	gtg	agc	cgf	ggc	atc	gac	cgc	atg	ctg	cgc	gac	cag	336
Glu	Ala	Arg	Lys	Val	Ser	Arg	Gly	Ile	Asp	Arg	Met	Leu	Arg	Asp	Gln	
100					105						110					

aag	cgc	gac	ctg	cag	cag	acg	cac	cgg	ctc	ctg	ctg	ctc	ggg	gct	ggt	384
Lys	Arg	Asp	Leu	Gln	Gln	Thr	His	Arg	Leu	Leu	Leu	Leu	Gly	Ala	Gly	
115					120						125					

newsumitomo.txt

gag tct ggg aaa agc acc atc gtc aaa cag atg agg atc ctg cac gtc		432
Glu Ser Gly Lys Ser Thr Ile Val Lys Gln Met Arg Ile Leu His Val		
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Asn Gly Phe Asn Pro Glu Glu Lys Lys Gln Lys Ile Leu Asp Ile Arg		
145 150 155 160		
aaa aat gtt aaa gat gct atc gtg aca att gtt tca gca atg agt act		528
Lys Asn Val Lys Asp Ala Ile Val Thr Ile Val Ser Ala Met Ser Thr		
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ata ata cct cca gtt ccg ctg gcc aac cct gaa aac caa ttt cga tca		576
Ile Ile Pro Pro Val Pro Leu Ala Asn Pro Glu Asn Gln Phe Arg Ser		
180 185 190		
gac tac atc aag agc ata gcc cct atc act gac ttt gaa tat tcc cag		624
Asp Tyr Ile Lys Ser Ile Ala Pro Ile Thr Asp Phe Glu Tyr Ser Gln		
195 200 205		
gaa ttc ttt gac cat gtg aaa aaa ctt tgg gac gat gaa ggc gtg aag		672
Glu Phe Phe Asp His Val Lys Lys Leu Trp Asp Asp Glu Gly Val Lys		
210 215 220		
gca tgc ttt gag aga tcc aac gaa tac cag ctg att gac tgt gca caa		720
Ala Cys Phe Glu Arg Ser Asn Glu Tyr Gln Leu Ile Asp Cys Ala Gln		
225 230 235 240		
tac ttc ctg gaa aga atc gac agc gtc agc ttg gtt gac tac aca ccc		768
Tyr Phe Leu Glu Arg Ile Asp Ser Val Ser Leu Val Asp Tyr Thr Pro		
245 250 255		
aca gac cag gac ctc ctc aga tgc aga gtt ctg aca tct ggg att ttt		816
Thr Asp Gln Asp Leu Leu Arg Cys Arg Val Leu Thr Ser Gly Ile Phe		
260 265 270		
gag aca cga ttc caa gtg gac aaa gta aac ttc cac atg ttt gat gtt		864
Glu Thr Arg Phe Gln Val Asp Lys Val Asn Phe His Met Phe Asp Val		
275 280 285		
ggt ggc cag agg gat gag agg aga aaa tgg atc cag tgc ttt aac gat		912
Gly Gly Gln Arg Asp Glu Arg Arg Lys Trp Ile Gln Cys Phe Asn Asp		
290 295 300		
gtc aca gct atc att tac gtc gca gcc tgc agt agc tac aac atg gtg		960
Val Thr Ala Ile Ile Tyr Val Ala Ala Cys Ser Ser Tyr Asn Met Val		
305 310 315 320		
att cga gaa gat aac aac acc aac agg ctg aga gag tcc ctg gat ctt		1008
Ile Arg Glu Asp Asn Asn Thr Asn Arg Leu Arg Glu Ser Leu Asp Leu		
325 330 335		
ttt gaa agc atc tgg aac aac agg tgg tta cgg acc att tct atc atc		1056
Phe Glu Ser Ile Trp Asn Asn Arg Trp Leu Arg Thr Ile Ser Ile Ile		
340 345 350		
ttg ttc ttg aac aaa caa gat atg ctg gca gaa aaa gtc ttg gca ggg		1104
Leu Phe Leu Asn Lys Gln Asp Met Leu Ala Glu Lys Val Leu Ala Gly		
355 360 365		
aaa tca aaa att gaa gac tat ttc cca gaa tat gca aat tat act gtt		1152
Lys Ser Lys Ile Glu Asp Tyr Phe Pro Glu Tyr Ala Asn Tyr Thr Val		
370 375 380		

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cct gaa gac gca aca cca gat gca gga gaa gat ccc aaa gtt aca aga 1200
Pro Glu Asp Ala Thr Pro Asp Ala Gly Glu Asp Pro Lys Val Thr Arg
385 390 395 400

gcc aag ttc ttt atc cgg gac ctg ttt ttg agg atc agc acg gcc acc 1248
Ala Lys Phe Phe Ile Arg Asp Leu Phe Leu Arg Ile Ser Thr Ala Thr
405 410 415

ggt gac ggc aaa cat tac tgc tac ccg cac ttc acc tgc gcc gtg gac 1296
Gly Asp Gly Lys His Tyr Cys Tyr Pro His Phe Thr Cys Ala Val Asp
420 425 430

aca gag aac atc cgc agg gtg ttc aac gac tgc cgc gac atc atc cag 1344
Thr Glu Asn Ile Arg Arg Val Phe Asn Asp Cys Arg Asp Ile Ile Gln
435 440 445

cgg atg cac ctc aag cag tat gag ctc ttg tga 1377
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<210> 3

<211> 44

<212> RNA

<213> artificial sequence

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<223> an example of the ribozyme of the present invention

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ucgccuccuu cugaugaggc cgaaaggccg aaaccgccuc gcgc

44

<210> 4

<211> 44

<212> RNA

<213> artificial sequence

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<211> 43

<212> RNA

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<212> RNA

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ucgccuccuu agaagccuac cagagaaaca cacguugugg uauauuaccu ggua 54
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<400> 8
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<211> 24
<212> DNA
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<400> 9
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<211> 37
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<220>
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acgatggtgtc ttttcccaga ctcaccagcc ccgagca 37
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<211> 21
<212> DNA
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<223> a primer used in an example of the present invention newsumitomo.txt

<400> 12
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<210> 13
<211> 22
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37

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29

<210> 16
<211> 36
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<210> 24
<211> 24
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<220>
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24

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<212> PRT
<213> Mus musculus

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20 25 30
Ser Ala Ala Pro Ala Pro Ala Ser Ile Pro Ala Pro Ala Pro Val Gly
35 40 45
Thr Leu Leu Arg Arg Gly Gly Arg Ile Val Ala Asn Ala Arg Pro
50 55 60
Pro Gly Glu Leu Gln Ser Arg Arg Arg Gln Glu Gln Leu Arg Ala Glu
65 70 75 80
Glu Arg Glu Ala Ala Lys Glu Ala Arg Lys Val Ser Arg Gly Ile Asp
85 90 95
Arg Met Leu Arg Glu Gln Lys Arg Asp Leu Gln Gln Thr His Arg Leu
100 105 110
Leu Leu Leu Gly Ala Gly Glu Ser Gly Lys Ser Thr Ile Val Lys Gln
115 120 125
Met Arg Ile Leu His Val Asn Gly Phe Asn Pro Glu Lys Lys Gln
130 135 140
Lys Ile Leu Asp Ile Arg Lys Asn Val Lys Asp Ala Ile Val Thr Ile
145 150 155 160
Val Ser Ala Met Ser Thr Ile Ile Pro Pro Val Pro Leu Ala Asn Pro
165 170 175
Glu Asn Gln Phe Arg Ser Asp Tyr Ile Lys Ser Ile Ala Pro Ile Thr
180 185 190
Asp Phe Glu Tyr Ser Gln Glu Phe Phe Asp His Val Lys Lys Leu Trp
195 200 205
Asp Asp Glu Gly Val Lys Ala Cys Phe Glu Arg Ser Asn Glu Tyr Gln
210 215 220
Leu Ile Asp Cys Ala Gln Tyr Phe Leu Glu Arg Ile Asp Ser Val Ser
225 230 235 240
Leu Val Asp Tyr Thr Pro Thr Asp Gln Asp Leu Leu Arg Cys Arg Val
245 250 255
Leu Thr Ser Gly Ile Phe Glu Thr Arg Phe Gln Val Asp Lys Val Asn
260 265 270
Phe His Met Phe Asp Val Gly Gln Arg Asp Glu Arg Arg Lys Trp
275 280 285
Ile Gln Cys Phe Asn Asp Val Thr Ala Ile Ile Tyr Val Ala Ala Cys
290 295 300
Ser Ser Tyr Asn Met Val Ile Arg Glu Asp Asn Asn Thr Asn Arg Leu
305 310 315 320
Arg Glu Ser Leu Asp Leu Phe Glu Ser Ile Trp Asn Asn Arg Trp Leu
325 330 335
Arg Thr Ile Ser Ile Ile Leu Phe Leu Asn Lys Gln Asp Met Leu Ala
340 345 350
Glu Lys Val Leu Ala Gly Lys Ser Lys Ile Glu Asp Tyr Phe Pro Glu
355 360 365

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Tyr Ala Asn Tyr Thr Val Pro Glu Asp Ala Thr Pro Asp Ala Gly Glu
370 375 380
Asp Pro Lys Val Thr Arg Ala Lys Phe Phe Ile Arg Asp Leu Phe Leu
385 390 395 400
Arg Ile Ser Thr Ala Thr Gly Asp Gly Lys His Tyr Cys Tyr Pro His
405 410 415
Phe Thr Cys Ala Val Asp Thr Glu Asn Ile Arg Arg Val Phe Asn Asp
420 425 430
Cys Arg Asp Ile Ile Gln Arg Met His Leu Lys Gln Tyr Glu Leu Leu
435 440 445

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<211> 450
<212> PRT
<213> Rattus norvegicus

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35 40 45
Val Gly Thr Leu Leu Arg Arg Gly Asp Gly Arg Ile Pro Ala Ser Ala
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Arg Ser Pro Val Glu Leu Gln Asn Arg Arg Arg Gln Glu Gln Leu Arg
65 70 75 80
Ala Glu Glu Arg Glu Ala Ala Lys Glu Ala Arg Lys Val Ser Arg Gly
85 90 95
Ile Asp Arg Met Leu Arg Glu Gln Lys Arg Asp Leu Gln Gln Thr His
100 105 110
Arg Leu Leu Leu Leu Gly Ala Gly Glu Ser Gly Lys Ser Thr Ile Val
115 120 125
Lys Gln Met Arg Ile Leu His Val Asn Gly Phe Asn Pro Glu Glu Lys
130 135 140
Lys Gln Lys Ile Leu Asp Ile Arg Lys Asn Val Lys Asp Ala Leu Val
145 150 155 160
Thr Ile Ile Ser Ala Met Ser Thr Ile Ile Pro Pro Val Pro Leu Ala
165 170 175
Asn Pro Glu Asn Gln Phe Arg Ser Asp Tyr Ile Lys Ser Ile Ala Pro
180 185 190
Ile Thr Asp Phe Glu Tyr Ser Gln Glu Phe Phe Asp His Val Lys Lys
195 200 205
Leu Trp Asp Asp Glu Gly Val Lys Ala Cys Phe Glu Arg Ser Asn Glu
210 215 220
Tyr Gln Leu Ile Asp Cys Ala Gln Tyr Phe Leu Glu Arg Ile Asp Ser
225 230 235 240
Val Ser Leu Val Asp Tyr Thr Pro Thr Asp Gln Asp Leu Leu Arg Cys
245 250 255
Arg Val Leu Thr Ser Gly Ile Phe Glu Thr Arg Phe Gln Val Asp Lys
260 265 270
Val Asn Phe His Met Phe Asp Val Gly Gly Gln Arg Asp Glu Arg Arg
275 280 285
Lys Trp Ile Gln Cys Phe Asn Asp Val Thr Ala Ile Ile Tyr Val Ala
290 295 300
Ala Cys Ser Ser Tyr Asn Met Val Ile Arg Glu Asp Asn Asn Thr Asn
305 310 315 320
Arg Leu Arg Glu Ser Leu Asp Leu Phe Glu Ser Ile Trp Asn Asn Arg
325 330 335
Trp Leu Arg Thr Ile Ser Ile Ile Leu Phe Leu Asn Lys Gln Asp Met
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355 360 365

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Pro Glu Tyr Ala Asn Tyr Thr Val Pro Glu Asp Ala Thr Pro Asp Ala
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 Gly Glu Asp Pro Lys Val Thr Arg Ala Lys Phe Phe Ile Arg Asp Leu
 385 390 395 400
 Phe Leu Arg Ile Ser Thr Ala Thr Gly Asp Gly Lys His Tyr Cys Tyr
 405 410 415
 Pro His Phe Thr Cys Ala Val Asp Thr Glu Asn Ile Arg Arg Val Phe
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 Leu Leu
 450

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 <213> Mus musculus

<220>
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Asp	Thr	Pro	Cys	Ala	Ala	Ser	Glu	Pro	Cys	Ala	Glu	Asp	Ala	Gln	Pro		
20						25						30					
agc	gcc	gcc	ccg	gcc	cct	g	cc	tc	atc	cca	gc	ccg	gct	ccc	gta	gg	144
Ser	Ala	Ala	Pro	Ala	Pro	Ala	Ser	Ile	Pro	Ala	Pro	Ala	Pro	Val	Gly		
35						40						45					
acc	ctg	ctc	cg	cg	g	gc	gc	cg	atc	gtc	gc	aa	gc	cg	cc	192	
Thr	Leu	Leu	Arg	Arg	Gly	Gly	Gly	Arg	Ile	Val	Ala	Asn	Ala	Arg	Pro		
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gag	cg	g	g	g	g	aa	g	g	gg	aa	gt	ag	cg	gg	atc	288	
Glu	Arg	Glu	Ala	Ala	Lys	Glu	Ala	Arg	Lys	Val	Ser	Arg	Gly	Ile	Asp		
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cg	at	ct	cg	g	ag	a	cg	g	at	ct	ca	cg	ca	cg	ct	336	
Arg	Met	Leu	Arg	Glu	Gln	Lys	Arg	Asp	Leu	Gln	Gln	Thr	His	Arg	Leu		
100						105						110					
ct	ct	ct	gg	g	g	aa	g	g	aa	ag	act	atc	gt	atc	aa	384	
Leu	Leu	Leu	Gly	Ala	Gly	Glu	Ser	Gly	Lys	Ser	Thr	Ile	Val	Lys	Gln		
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at	ag	at	ct	ca	gt	aa	gg	tc	gg	aa	ag	atc	gt	atc	aa	432	
Met	Arg	Ile	Leu	His	Val	Asn	Gly	Phe	Asn	Pro	Glu	Glu	Lys	Lys	Gln		
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aa	aa	aa	ct	g	at	gg	aa	aa	at	aa	aa	aa	aa	aa	aa	480	
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145						150					155				160		

newsumitomo.txt

gtt tca gca atg agt act atc ata cct cca gtt cca ctg gcc aac cct	528
Val Ser Ala Met Ser Thr Ile Ile Pro Pro Val Pro Leu Ala Asn Pro	
165 170 175	
gag aac cag ttc cgg tca gat tat atc aag agc ata gcc cct atc act	576
Glu Asn Gln Phe Arg Ser Asp Tyr Ile Lys Ser Ile Ala Pro Ile Thr	
180 185 190	
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Asp Phe Glu Tyr Ser Gln Glu Phe Phe Asp His Val Lys Lys Leu Trp	
195 200 205	
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210 215 220	
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Leu Ile Asp Cys Ala Gln Tyr Phe Leu Glu Arg Ile Asp Ser Val Ser	
225 230 235 240	
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Leu Val Asp Tyr Thr Pro Thr Asp Gln Asp Leu Leu Arg Cys Arg Val	
245 250 255	
ctg aca tca gga atc ttt gag aca cga ttc caa gtg gac aaa gtg aac	816
Leu Thr Ser Gly Ile Phe Glu Thr Arg Phe Gln Val Asp Lys Val Asn	
260 265 270	
ttt cac atg ttt gat gtt gga ggc cag aga gat gag aga aga aaa tgg	864
Phe His Met Phe Asp Val Gly Gly Gln Arg Asp Glu Arg Arg Lys Trp	
275 280 285	
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Ile Gln Cys Phe Asn Asp Val Thr Ala Ile Ile Tyr Val Ala Ala Cys	
290 295 300	
agt agc tac aac atg gtg atc cgg gaa gat aac aat acc aac aga ctt	960
Ser Ser Tyr Asn Met Val Ile Arg Glu Asp Asn Asn Thr Asn Arg Leu	
305 310 315 320	
cgg gaa tca ctg gac ctg ttt gaa agc atc tgg aat aac agg tgg ttg	1008
Arg Glu Ser Leu Asp Leu Phe Glu Ser Ile Trp Asn Asn Arg Trp Leu	
325 330 335	
cga acc att tct atc atc cta ttc ttg aac aaa caa gac atg ctg gca	1056
Arg Thr Ile Ser Ile Ile Leu Phe Leu Asn Lys Gln Asp Met Leu Ala	
340 345 350	
gaa aaa gtc ttg gca ggg aag tca aaa atc gaa gac tat ttc ccg gag	1104
Glu Lys Val Leu Ala Gly Lys Ser Lys Ile Glu Asp Tyr Phe Pro Glu	
355 360 365	
tat gcc aat tat act gtc cct gaa gat gca aca cca gat gcg gga gaa	1152
Tyr Ala Asn Tyr Thr Val Pro Glu Asp Ala Thr Pro Asp Ala Gly Glu	
370 375 380	
gat ccc aaa gtt aca aga gca aag ttc ttt atc cgg gat ctg ttc ttg	1200
Asp Pro Lys Val Thr Arg Ala Lys Phe Phe Ile Arg Asp Leu Phe Leu	
385 390 395 400	
agg atc agc aca gcc acg ggt gat ggc aaa cat tac tgc tac cct cac	1248
Arg Ile Ser Thr Ala Thr Gly Asp Gly Lys His Tyr Cys Tyr Pro His	
405 410 415	

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Phe Thr Cys Ala Val Asp Thr Glu Asn Ile Arg Arg Val Phe Asn Asp	
420 425 430	
tgc cgt gac atc atc cag aga atg cat ctc aag cag tac gaa ctc ttg	1344
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Met Gly Leu Cys Tyr Ser Leu Arg Pro Leu Leu Phe Gly Ser Ser Gly	
1 5 10 15	
gac gcc ccc tgt gag gac tct gag ccg tgc gct gag gat gct cag ccc	96
Asp Ala Pro Cys Glu Asp Ser Glu Pro Cys Ala Glu Asp Ala Gln Pro	
20 25 30	
agc gcc gcc ccg gcc ccg gcc ccg atc cca gcc ccg gct ccg	144
Ser Ala Ala Pro Ala Pro Ala Pro Ile Pro Ala Pro Ala Pro Ala Pro	
35 40 45	
gtg ggg acc ctg ctc ccg cga ggc gac ggc ccg atc ccc gca agc gcg	192
Val Gly Thr Leu Leu Arg Arg Gly Asp Gly Arg Ile Pro Ala Ser Ala	
50 55 60	
agg tcg cca gtc gag ctg cag aac cgc ccg cga cag gag cag ctc cga	240
Arg Ser Pro Val Glu Leu Gln Asn Arg Arg Gln Glu Gln Leu Arg	
65 70 75 80	
gcc gag gag cgc gag gca gct aag gag gcg agg aaa gta agc cgg ggt	288
Ala Glu Glu Arg Glu Ala Ala Lys Glu Ala Arg Lys Val Ser Arg Gly	
85 90 95	
atc gac cgc atg ctg cgc gaa cag aag cgc gac ctg cag cag acg cac	336
Ile Asp Arg Met Leu Arg Glu Gln Lys Arg Asp Leu Gln Gln Thr His	
100 105 110	
cgg ctc ctg ctc ttg ggg gct ggt gag tcc ggg aaa agc act ata gtc	384
Arg Leu Leu Leu Gly Ala Gly Glu Ser Gly Lys Ser Thr Ile Val	
115 120 125	
aaa cag atg agg atc cta cac gtc aat ggc ttc aac ccc gag gaa aag	432
Lys Gln Met Arg Ile Leu His Val Asn Gly Phe Asn Pro Glu Glu Lys	
130 135 140	
aag cag aaa att ctg gac atc agg aaa aat gtc aaa gat gct tta gtg	480
Lys Gln Lys Ile Leu Asp Ile Arg Lys Asn Val Lys Asp Ala Leu Val	
145 150 155 160	
aca atc att tca gca atg agt acc ata ata cct cca gtt cca ctg gcc	528
Thr Ile Ile Ser Ala Met Ser Thr Ile Ile Pro Pro Val Pro Leu Ala	

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165

170

175

aac cct gag aac cag ttt cgg tca gat tac atc aag agc ata gcc cct			576
Asn Pro Glu Asn Gln Phe Arg Ser Asp Tyr Ile Lys Ser Ile Ala Pro			
180	185	190	
atc act gac ttt gaa tat tcc cag gag ttc ttt gac cac gtg aag aag			624
Ile Thr Asp Phe Glu Tyr Ser Gln Glu Phe Phe Asp His Val Lys Lys			
195	200	205	
ctg tgg gat gat gag gga gtg aag gcc tgc ttt gag aga tcc aac gag			672
Leu Trp Asp Asp Glu Gly Val Lys Ala Cys Phe Glu Arg Ser Asn Glu			
210	215	220	
tac cag ctg atc gac tgt gca caa tac ttc ctg gaa agg att gac agc			720
Tyr Gln Leu Ile Asp Cys Ala Gln Tyr Phe Leu Glu Arg Ile Asp Ser			
225	230	235	240
gtg agt ctg gtt gac tac aca ccc aca gac cag gac cta ctc aga tgc			768
Val Ser Leu Val Asp Tyr Thr Pro Thr Asp Gln Asp Leu Leu Arg Cys			
245	250	255	
aga gtg ctg aca tca ggg atc ttt gag aca cga ttc caa gtg gac aaa			816
Arg Val Leu Thr Ser Gly Ile Phe Glu Thr Arg Phe Gln Val Asp Lys			
260	265	270	
gtg aac ttt cac atg ttt gac gtt gga ggc cag agg gat gag aga aga			864
Val Asn Phe His Met Phe Asp Val Gly Gly Gln Arg Asp Glu Arg Arg			
275	280	285	
aaa tgg atc cag tgt ttt aac gat gtc act gcc atc atc tat gtg gca			912
Lys Trp Ile Gln Cys Phe Asn Asp Val Thr Ala Ile Ile Tyr Val Ala			
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Ala Cys Ser Ser Tyr Asn Met Val Ile Arg Glu Asp Asn Asn Thr Asn			
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aga ctc cgg gag tcg ctg gac ctg ttt gaa agc atc tgg aat aac agg			1008
Arg Leu Arg Glu Ser Leu Asp Leu Phe Glu Ser Ile Trp Asn Asn Arg			
325	330	335	
tgg tta cga acc att tcc atc atc ctg ttc ttg aac aaa caa gat atg			1056
Trp Leu Arg Thr Ile Ser Ile Ile Leu Phe Leu Asn Lys Gln Asp Met			
340	345	350	
ctg gca gaa aaa gtc ttg gcc ggg aag tca aaa att gaa gac tat ttc			1104
Leu Ala Glu Lys Val Leu Ala Gly Lys Ser Lys Ile Glu Asp Tyr Phe			
355	360	365	
ccg gag tat gcc aac tat act gtc cct gaa gat gca aca cca gat gca			1152
Pro Glu Tyr Ala Asn Tyr Thr Val Pro Glu Asp Ala Thr Pro Asp Ala			
370	375	380	
gga gaa gat ccc aaa gtt aca aga gcc aag ttc ttt atc cgg gat ctg			1200
Gly Glu Asp Pro Lys Val Thr Arg Ala Lys Phe Phe Ile Arg Asp Leu			
385	390	395	400
ttc ttg agg atc agc aca gcc acg ggt gat ggc aaa cat tac tgc tac			1248
Phe Leu Arg Ile Ser Thr Ala Thr Gly Asp Gly Lys His Tyr Cys Tyr			
405	410	415	
cct cac ttc acc tgc gcc gtg gac aca gag aac atc cgc aga gtg ttc			1296

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Pro His Phe Thr Cys Ala Val Asp Thr Glu Asn Ile Arg Arg Val Phe		
420	425	430
aac gat tgt cgt gac atc atc cag aga atg cac ctc aag cag tac gaa	1344	
Asn Asp Cys Arg Asp Ile Ile Gln Arg Met His Leu Lys Gln Tyr Glu		
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